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SOME FLORAL FEATURES OF MEXICO*

BY H. H. RUSBY

(Continued from April Torreya)

One of the most beautiful spots that I have ever visited is that of the lava beds a few miles south of Mexico City, on the railroad leading to Cuernavaca. This has been one of the favor-

ite collecting grounds of our Mr. Pringle, for which reason alone it should always possess a deep interest for American botanists. As I remember, Cuernavaca is distant from the City of Mexico in a straight line only about fifteen miles, but, since the train has to pass over a summit more than ten thousand feet in height, about three thousand feet higher than Mexico, we travel some fifty miles in reaching it. The mountain thus traversed consists of the roughest kind of lava formation, full of deep gullies and ravines which are bordered by rugged and often overhanging walls, with sharp pockets, sometimes caves, and innumerable abrupt and jagged projections. Were this surface to be viewed with its vegetation wholly removed, it would appear as though the growth of ordinary vegetation upon it was almost impossible, yet it bears a flora of the richest character and greatest interest, and one that is varied in every sense of the term. Much of its surface is covered with a fine forest of good sized pines, with some cypress and other coniferous evergreens. At places this gives way to arborescent *Arctostaphylos*, with many oaks. Its shrubs grow densely and represent so many families and genera that from a systemic point of view this growth is scarcely characteristic. It is, however, the herbaceous growth which is most varied and interesting. If everything but the ferns were removed the appearance would still be that of an abundant vegetation. Taking only five or six good specimens of each species, I could have loaded my portfolio within an area of a hundred yards square. This is the natural home of the dahlia and one is bewildered by the variety which it displays. It is impossible to say whether the different forms are mere variations, or hybrids, or numerous closely related species. Acres are covered with them and they are often from six to eight feet in height. They are for the most part of very slender habit. Pentstemons, lamourouxias and other scarlet-flowered figworts are very conspicuous. Verbenas are abundant and varied, as are castilleias, and there are dazzling golden patches of composites lying flat upon the ground. Beautiful asters and flea-banes abound. The cool, damp, open places at the higher altitudes are densely carpeted with a free blooming, large-flowered *Stellaria*. Upon

the summit of this range there is a kind of table land which for many miles forms an open prairie. The predominant grass grows in very large and high bogs or hummocks in the rich black soil. The roots of this grass are shipped by train loads to Germany, it is said for the manufacture of some sort of a brush or broom. Abruptly descending upon the southern side of this range, we cross a broad cultivated valley or plain and there follow

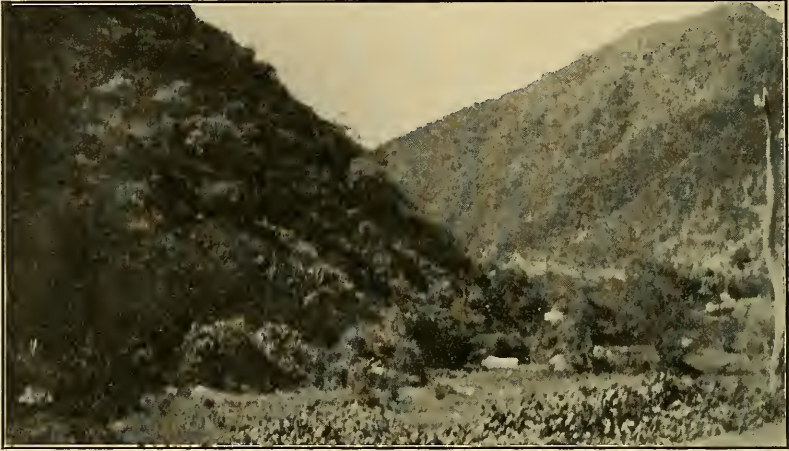


FIG. 4. The Great Oaxaca Canyon.

a river through a deep canyon which traverses a range which appears of even greater height than that previously crossed. Upon the other side we continue down this river valley until it empties into the Balsas, at the town of Balsas, which is the end of the railroad line. I made no stop in this second range but it was very evident that its flora is totally distinct from that of the Cuernavaca Mountains. At Balsas we are distant about fifty miles from the Pacific, though as the river runs, the distance is much greater. We are in the midst of a multitude of gigantic mountains, which continues without interruption almost to the ocean's edge. Except in the immediate vicinity of the streams this mountain region is very arid. The rainy season is of short duration and the rains are usually not at all copious. The ground therefore has but a slight permanent supply of moisture,

springs are scarce, and the vegetation dries up with surprising quickness at the close of the rainy season. Nevertheless, while the season lasts, this vegetation is fairly abundant and varied. It is, moreover, rather peculiar to the region, therefore of special interest. Not only the herbaceous vegetation, but the shrubs and trees, are of strange relationship. Among the smaller trees, an extremely poisonous species of *Rhus* is perhaps most noticeable. Near the water the alligator pear grows spontaneously and reaches a rather large size. The canyons and gulches are full of beautiful white-flowered or violet-tinted acacias. A small arborescent *Malpighia*, with edible fruit, is abundant. The ground is covered in many places with gorgeous *Tribulus*,



FIG. 5. Balsas Mountains, Guerrero.

in others with *Ruellia*, and very often with some plant related to *Allionia*, but with handsome rose-purple flowers as large as ordinary morning-glories. Many Asclepiadaceous vines twine among the shrubbery. The *Echinocacti* are of peculiar type, scarcely projecting above the ground and crowned with woolly tufts.

I twice visited Limon Mountain, about four miles from the town of Balsas, and the crowning peak of the region. Its sides are extremely steep and for the most part densely clothed with

small trees and shrubs, Mimosaceae predominating. One of these small trees is a *Clerodendron*, or ally thereof, with very showy flowers. Another tree is a beautiful new species of *Hauya*. A new species of *Linociera* bore excellent edible fruit. The open spaces were clothed with composites and shrubby heliotropes and a graceful bamboo grows freely. *Vitis blanco* is a very peculiar grape, with massive but inedible fruit. Upon the rich shaded banks beautiful *Achimenes* intermingle with a plant related to *Tradescantia*, its broad fleshy leaves lying flat upon the ground and beautifully variegated with purple and several shades of green. Here grew upon the rocks, in sunny places, a peculiar *Opuntia*, unlike any that I have seen elsewhere, and about the edges of cliffs were robust growths of *Plumiera*. Quite a collection of plants was obtained upon this mountain but I have found no opportunity of studying them.

Returning to Mexico City, and traveling thence *via* Puebla, we pass down into the state of Oaxaca, a region which is really a continuation of the Balsas district, though farther south and correspondingly hotter. Its conditions of aridity are about the same as those of Balsas. Like Balsas, too, it possesses a formidable mountain range. In the highlands about Puebla, we are surprised to see the otherwise bare ground densely carpeted with a bright rusty yellow *Cuscuta*. It probably lives upon grass rhizomes.

Approaching Oaxaca, we pass for many miles through one of the greatest of mountain canyons, in some places approaching in depth and grandeur our Grand Canyon of the Colorado. Some of the summits in the vicinity of this canyon are said to be almost inaccessible, while others can be scaled only on foot and by a few circuitous routes. Several days were spent in this canyon. My special work was laborious and exacting, but I managed to snatch a collection of nearly a hundred species. These and the very many that I saw without being able to collect them, have left me with an intense desire to spend some time in that region. The proper time to collect here is from late June to September. In the bottoms of the canyons and along the sides of the shaded ravines, where one can traverse them, he finds a

profusion of strange forms and many exceedingly beautiful ones. When he succeeds in passing over and among the mountain tops he finds forests of oak, mingled with a great variety of other trees and thickly clothed with epiphytes, including many orchids, ferns and bromeliads. Wherever he encounters a little stream or some boggy ground, there is a world of little things which add

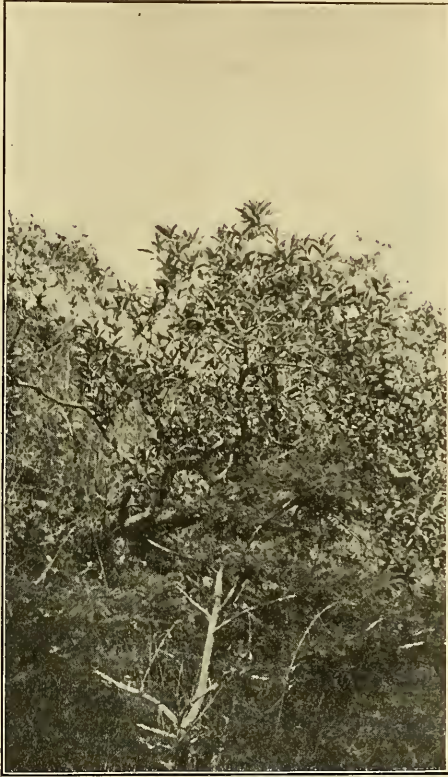


FIG. 6. *Byrsonima Karwinskiana*.

a peculiar charm to the day's study. Along the larger streams we see many trees at whose affinities we can hardly guess. One of them is heavily clothed at the ends of the branchlets with tufts of thick, shining linear leaves resembling in outline and size the fruits of the catalpa, and having dense masses of fruits resembling

small, unopened cotton bolls. The shrubbery in the river bottom is completely covered with what we take to be wild grape vine but which proves to be a broad-leaved bignoniad. Among the lower hills we find a dense growth of horrible *Jatropha* shrubs and tangled among their bases a peculiar *Pedilanthus*. Plumieras are also abundant and like the two last-named are capable of yielding some rubber. Every bank is gay with *Tribulus* and Nyctaginaceae. Asclepiadaceous vines and ipomeas are every-



FIG. 7. Near the summit of Limon Mountain, Guerrero.

where. In one of the gulches I found an undescribed species of mulberry.

The plains and lower hills of this valley are almost exclusively

occupied by a cactaceous growth. Although there are many *Opuntias*, the predominant forms are of the giant *Cereus* type. The most conspicuous and truly gigantic of them is locally known as "cardon" and is, I believe, a species of *Pachycereus*. I have seen a single tree under which, I believe, almost an entire company of mounted cavalry might gather. These species bear, for the most part, delicious edible fruits. Among the rocks on the hillsides, great numbers of *mammillarias* and other dwarf species are encountered.

We cannot get much farther south than Oaxaca without getting into the truly tropical vegetation of the lowlands. Indeed, we have only to cross the great mountain range south of this canyon, a distance of some fifteen miles, to find ourselves in the fever infested fens of the Tuxtepec valley.

Here of course the flora is almost totally distinct from anything that has been described. The trees are the huge giants which characterize our American tropics and the vines which bind them together are great woody climbers with trunks several inches in diameter and branches extending for hundreds of feet. A variety of palms, some of them of exceeding beauty, occupy the slopes and among them are gigantic, as well as curious and beautiful aroids and superb cycads. Huge ferns, fuchsias, begonias and oxalids occupy the ledges and steeper banks, and both terrestrial and arboreal orchids are abundant. The rivers are bordered by great *Fici*, and several species of *spondias*, and the swamps are filled with the peculiar *Glumaceae* and showy aquatics which characterize similar situations throughout our tropics. Of this tropical region, time will not permit me to speak, but I can say that, while its general character is like that of Central America, its specific characters are largely unknown.

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